



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/US97/18302 <b>(22) International Filing Date:</b> 9 October 1997 (09.10.97)  <b>(30) Priority Data:</b> 08/731,537 16 October 1996 (16.10.96) US  <b>(71) Applicant:</b> S.C. JOHNSON & SON, INC. [US/US]; 1525 Howe Street, Racine, WI 53403 (US).  <b>(72) Inventor:</b> MALEK, Edward, J.; 213 South Colony Avenue, Union Grove, WI 53182 (US).  <b>(74) Agents:</b> FRANK, J., William, III et al.; S.C. Johnson & Son, Inc., Patent Section, 1525 Howe Street, MS077, Racine, WI 53403 (US).		<b>(81) Designated States:</b> AU, BR, CA, CN, JP, KR, MX, NZ, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.          Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
<b>(54) Title:</b> AIR FRESHENER DEVICE WITH DISPENSING ACTUATOR FEATURE		
<b>(57) Abstract</b>		
<p>This invention provides a disposable air freshener dispenser device (10) which features a push-button actuator means (18) which can be manually operated to initiate the dispensing of air freshener into the atmosphere. The dispenser has an interactive combination of air freshener medium (30), capillary wick (13), thin impermeable membrane seal (14), absorbent matrix (16) and push-button actuator (18). Downward pressure of the actuator causes rupture of the thin membrane and the release of air freshener medium from a container reservoir.</p>		

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## AIR FRESHENER DEVICE WITH DISPENSING ACTUATOR FEATURE

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TECHNICAL FIELD

This invention generally relates to dispensers of vaporizable media. More specifically, this invention relates to a device for dispensing a fragrance or deodorant in the form of a vapor for air freshening in an enclosed environment.

BACKGROUND ART

10 The need for effectively combating airborne malodors in homes and enclosed public buildings, by odor masking or destruction, is well established. Various kinds of vapor-dispensing devices have been employed for this purpose. The most common of such devices is the aerosol container which propels minute droplets of an air freshener composition into the air. Another common type of dispensing device is a  
15 dish containing or supporting a body of gelatinous matter which when it dries and shrinks releases a vaporized air-treating composition into the atmosphere. Other products such as deodorant blocks are also used for dispensing air-treating vapors into the atmosphere by evaporation. Another group of vapor-dispensing devices utilizes a carrier material such as paperboard impregnated or coated with a vaporizable  
20 composition.

Wicking devices are well known for dispensing volatile liquids into the atmosphere, such as fragrance, deodorant, disinfectant or insecticide active agent.

A typical wicking device utilizes a combination of a wick and emanating region to dispense a volatile liquid from a liquid reservoir. Wicking devices are  
25 described in United States Patent Numbers 1,994,932; 2,597,195; 2,802,695; 2,804,291; 3,550,853; 4,286,754; 4,413,779; 4,454,987; 4,913,350; and 5,000,383; incorporated by reference.

A number of recent developments include a liquid air-treating composition in an enclosure, all or part of which is formed of a polymeric film through which the air-  
30 treating composition can migrate to be released as a vapor at an outer surface. Use of

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this type of permeable polymeric membrane controls the dispensing of air-treating vapors and tends to eliminate great variations in the rate of dispensing over the life of the product. While the vapor-permeable membrane type of air freshener dispenser devices are widely accepted and popular with consumers, they require the removal of  
5 a peelable vapor-impermeable membrane to initiate the evaporation of air freshener medium into the atmosphere.

With respect to structural design, some air freshener dispensers are expensive to manufacture. Other air freshener dispensers are inexpensive to produce, but tend to have inferior construction and functionality.

10 There remains a need for a well-constructed air freshener dispenser device which can be mass-produced economically, and can deliver a vapor medium at a controlled uniform rate over an extended period of time and which does not require inconvenient manipulation by the consumer.

Accordingly, it is an object of this invention to provide an improved air  
15 freshener dispenser device for delivering an odorant and/or deodorant vapor in an enclosed environment.

It is another object of this invention to provide a disposable air freshener dispenser device having an assembly of plastic units which can be produced economically by extrusion or thermoforming means.

20 It is another object of this invention to provide an air freshener dispenser device which has an actuator function for the convenient initiation of air freshener dispensing by the consumer.

Other objects and advantages of the present invention shall become apparent from the accompanying description and drawings.

25 DESCRIPTION OF THE INVENTION

One or more objects of the present invention are accomplished by the provision of a disposable air freshener dispenser device comprising an annular container with a sealed interior reservoir of air freshener medium, featuring a functional improvement which comprises an interactive combination of air freshener  
30 medium, wicking means, thin impermeable membrane sealing means, absorbent

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matrix and actuator means, wherein the actuator means is adapted for manual access whereby the thin membrane is ruptured and the air freshener medium is wicked to the absorbent matrix and evaporated into the atmosphere.

In a preferred embodiment, the present invention provides a disposable air

5 freshener dispenser device comprising:

- (a) an annular container with an upper edge flange which forms a flat margin around the open interior of the container, and the said flange has a raised rim around the periphery forming a flange shallow tray enclosure;
- 10 (b) a nonporous centerpost wick which is centrally positioned in the container, and extends between the bottom surface and the open top surface of the container, and which has at least one capillary groove extended along the vertical length of the centerpost wick surface, and which has at least one vertical prong extension means at the upper end of the centerpost wick;
- 15 (c) a thin impermeable membrane which covers the open top space of the container and is bonded to the flange margin, and the membrane forms a sealed reservoir enclosure within the container interior;
- 20 (d) a volatile air freshener medium which is contained within the reservoir enclosure in contact with the centerpost wick;
- 25 (e) a vapor-emanating absorbent matrix which is positioned within the flange shallow tray enclosure proximate to the thin membrane;
- (f) a cap-type cover means which is removably secured to the flange peripheral rim, and which has vapor venting means; and
- 30

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- (g) a push-button actuator means which is centrally inset  
and supported by the cap-type cover;  
wherein the air freshener medium, centerpost wick, thin membrane, absorbent matrix  
and push-button actuator are an interactive combination, whereby downward pressure  
5 on the push-button actuator causes rupture of the thin membrane, and permits the air  
freshener medium to transfer by wicking to the absorbent matrix, and to evaporate  
through the vented cap-type cover into the atmosphere.

### DESCRIPTION OF THE DRAWINGS

10 FIG. 1 is a composite prospective view of an invention air freshener dispenser  
device.

FIG. 2 is an elevational side view of an invention device nonporous centerpost  
wick.

FIG. 3 is an elevational side view of an assembled invention air freshener  
15 dispenser device.

FIG. 4 is a cross-sectional side view of a FIG. 3 device, taken along lines 4-4,  
which includes a reservoir content of liquid air freshener medium.

### BEST MODE FOR CARRYING OUT THE INVENTION

20 FIG. 1 illustrates an exploded view of present invention air freshener dispenser  
device 10.

In assembled form, dispenser device 10 preferably includes outer shell  
container 22, which is removably secured and structurally adapted to enclose and  
support dispenser container 12. Raised rim 24 on the bottom surface of outer shell  
25 container 22 is dimensionally conformational with the bottom end of dispenser  
container 12, so that dispenser container 12 is frictionally secured to outer shell  
container 22.

It is preferred that outer shell container 22 and dispenser container 12 in FIG.  
1 have transparency so that the level of an air freshener medium (not shown) in  
30 dispenser container 12 is visible.

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Outer shell container 22, dispenser container 12, push-button actuator 18 and vented cap-type cover 20 can be constructed by either injection or thermoform molding of a thermoplastic polymer such as polyethylene, polypropylene, polyvinyl chloride, polystyrene, polyvinyl acetate, polyamide, polymethacrylate, and the like.

- 5 Outer shell container 22 and dispenser container 12 can be annular-shaped structures with a vertical or slanted sidewall. The container sidewalls also can have a concave curvature for purposes of esthetic package design.

- Membrane 14 in FIG. 1 is a thin liquid-impermeable and vapor-impermeable seal which covers the open well of dispenser container 12, and is bonded to flange  
10 margin 15 when dispenser device 10 is assembled. Membrane 14 typically is an aluminum foil or nylon film.

Absorbent matrix 16 in FIG. 1 is a flexible liquid-permeable vapor-emanating pad, such as a porous thermoplastic or cellulosic composition.

- When dispenser device 10 of FIG. 1 is in assembled form, absorbent matrix 16  
15 is positioned within the shallow tray enclosure of flange margin 15, where it is supported by radial fins 21 proximate to membrane 14.

- A novel feature of dispenser device 10 is nonporous centerpost wick 13 which is centrally positioned in dispenser container 12. FIG. 2 is an elevational side view of centerpost wick 13. Capillary grooves 25 terminate in the form of prong extension 27.  
20 As illustrated in FIG. 2, centerpost wick 13 has four sets of capillary grooves 25, terminating as four prong extensions 27.

- Centerpost wick 13 can be constructed of any solid material which can be striated with capillary grooves 25, and which is inert to the air freshener medium content of dispenser container 12. It is advantageous to form both centerpost wick 13  
25 and dispenser container 12 as a unitary molded thermoplastic structure, such as injection molded polyethylene or polypropylene.

FIG. 3 is an elevational side view of dispenser device 10 when it is fully assembled with outer shell container 22 supporting and enclosing dispenser container 12. Outer shell container 22 and dispenser container 12 are frictionally secured by

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raised rim 24. As illustrated in FIG. 3, cap-type cover 20 is attached to the peripheral raised rim of flange margin 15 by snap-on means (not shown).

FIG. 4 is a cross-sectional side view of an assembled FIG. 3 device, illustrating a reservoir content of air freshener medium 30 in dispenser container 22.

5        Air freshener medium 30 in FIG. 4 can be any air treating material which can migrate up centerpost wick 13 by capillary action. Typically air freshener medium 25 is a fragrance or deodorant in liquid or gel form.

Preferably, air freshener medium 30 is a liquid fragrance comprising one or more volatile organic compounds which are available from perfumery suppliers such  
10 as Firmenich Inc., Takasago Inc., Noville Inc., Quest Co., and Givaudan-Roure Corp.

Most conventional fragrance materials are volatile essential oils. The fragrance can be a synthetically formed material, or a naturally derived oil such as oil of Bergamot, Bitter Orange, Lemon, Mandarin, Caraway, Cedar Leaf, Clove Leaf, Cedar Wood, Geranium, Lavender, Orange, Origanum, Petitgrain, White Cedar,  
15 Patchouli, Lavandin, Neroli, Rose absolute, and the like.

A wide variety of chemicals are known for perfumery, such as aldehydes, ketones, esters, alcohols, terpenes, and the like. A fragrance can be relatively simple in composition, or can be a complex mixture of natural and synthetic chemical components.

20        A typical scented oil can comprise woody/earthy bases containing exotic constituents such as sandalwood oil, civet, patchouli oil, and the like. A scented oil can have a light floral fragrance, such as rose extract or violet extract. Scented oil also can be formulated to provide desirable fruity odors, such as lime, lemon or orange.

25        Synthetic types of fragrance compositions either alone or in combination with natural oils are described in United States Patents 4,314,915; 4,411,829; and 4,434,306; incorporated herein by reference. Other artificial liquid fragrances include geraniol, geranyl acetate, eugenol, isoeugenol, linalool, linalyl acetate, phenethyl alcohol, methyl ethyl ketone, methylionone, isobornyl acetate, and the like.



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Air freshener medium 30 also can be a liquid formulation containing a volatile pesticide such as p-dichlorobenzene, or a therapeutic agent such as menthol.

FIG. 2 and FIG. 4 taken together illustrate an important aspect of an invention dispenser device 10. Air freshener medium 30, centerpost wick 13, thin membrane 14, absorbent matrix 16 and push-button actuator 18 are in an interactive operational relationship.

Downward manual pressure on push-button actuator 18 compresses absorbent matrix 16 against thin membrane 14. The force of the downward pressure causes a rupture of flexible thin membrane 14 by prong extensions 27 of centerpost wick 13.

Air freshener medium 30 is transferred by capillary grooves 25 of centerpost wick 13 to absorbent matrix 16, via the rupture points in thin membrane 14. Air freshener medium 30 then emanates as a vapor from absorbent matrix 16 through vented cap-type cover 20, and disperses into the atmosphere.

Invention air freshener dispenser device 10 can be produced in high volume from relatively inexpensive plastic materials. After usage, an invention dispenser device qualifies for disposal as a non-hazardous solid waste.

#### INDUSTRIAL APPLICABILITY

This invention is useful for creating products to disseminate a pleasant and/or masking fragrance into the atmosphere within a room or other space.

WHAT I CLAIM IS:

1. In a disposable air freshener dispenser device comprising an annular container with a sealed interior reservoir of air freshener medium, the improvement which comprises  
5 an interactive combination of air freshener medium, wicking means, thin impermeable membrane sealing means, absorbent matrix and actuator means, wherein the actuator means is adapted for manual access whereby the thin membrane is ruptured and the air freshener medium is wicked to the absorbent matrix and evaporated into the atmosphere.
- 10
2. A disposable air freshener dispenser device comprising:
- (a) an annular container with an upper edge flange which forms a flat margin around the open interior of the container, and the said flange has a raised rim around  
15 the periphery forming a flange shallow tray enclosure;
  - (b) A nonporous centerpost wick which is centrally positioned in the container, and extends between the bottom surface and the open top surface of the container, and which has at least one capillary groove  
20 extended along the vertical length of the centerpost wick surface, and which has at least one vertical prong extension means at the upper end of the centerpost wick;
  - (c) a thin impermeable membrane which covers the open  
25 top space of the container and is bonded to the flange margin, and the membrane forms a sealed reservoir enclosure within the container interior;
  - (d) a volatile air freshener medium which is contained within the reservoir enclosure in contact with the  
30 centerpost wick;

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- (e) a vapor-emanating absorbent matrix which is positioned within the flange shallow tray enclosure proximate to the thin membrane;
- (f) a cap-type cover means which is removably secured to the flange peripheral rim, and which has vapor venting means; and
- (g) a push-button actuator means which is centrally inset and supported by the cap-type cover;

wherein the air freshener medium, centerpost wick, thin membrane, absorbent matrix and push-button actuator are an interactive combination, whereby downward pressure on the push-button actuator causes rupture of the thin membrane, and permits the air freshener medium to transfer by wicking to the absorbent matrix, and to evaporate through the vented cap-type cover into the atmosphere.

3. A dispenser device in accordance with claim 2 wherein the container, cap-type cover and push-button actuator are molded thermoplastic structures.

4. A dispenser device in accordance with claim 2 wherein the container, cap-type cover and push-button actuator are molded polyethylene or polypropylene structures.

5. A dispenser device in accordance with claim 2 wherein the container and centerpost wick comprise a unitary molded thermoplastic structure.

6. A dispenser device in accordance with claim 2 wherein the container has transparency, and the air freshener medium in the reservoir enclosure is visible.

7. A dispenser device in accordance with claim 2 wherein the centerpost wick has multiple sets of capillary grooves extended along the vertical length of the centerpost wick surface, and each set of capillary grooves terminates in the form of a vertical prong extension at the upper end of the centerpost wick.

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8. A dispenser device in accordance with claim 2 wherein the thin impermeable membrane is an aluminum foil or nylon film.

5 9. A dispenser device in accordance with claim 2 wherein the air freshener medium is a liquid fragrance composition.

10. A dispenser device in accordance with claim 2 wherein the air freshener medium is a liquid pesticide composition.

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11. A dispenser device in accordance with claim 2 wherein the air freshener medium is a liquid therapeutic composition.

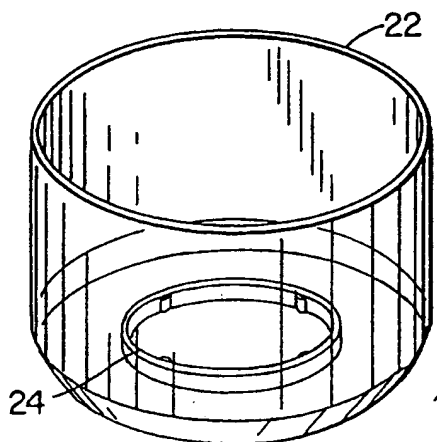
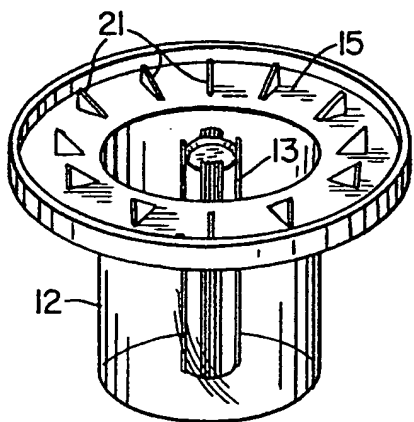
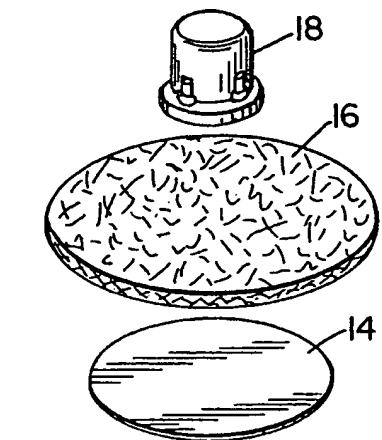
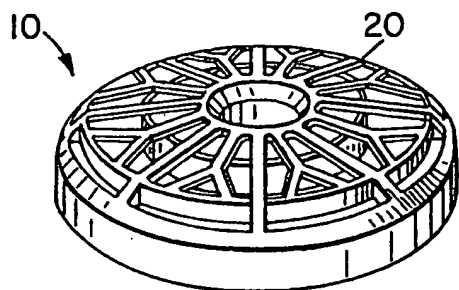
12. A dispenser device in accordance with claim 2 wherein the absorbent matrix  
15 comprises a flexible liquid-permeable thermoplastic or cellulosic pad composition.

13. A dispenser device in accordance with claim 2 wherein the push-button actuator is adapted for manual access and initiation.

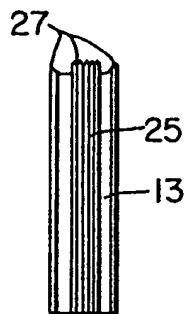
20 14. A dispenser device in accordance with claim 2 which is in further combination with an outer shell container which is removably secured and structurally adapted to enclose and support the dispenser container.

15. A dispenser device in accordance with claim 14 wherein the outer shell container  
25 is a molded thermoplastic structure with transparency.

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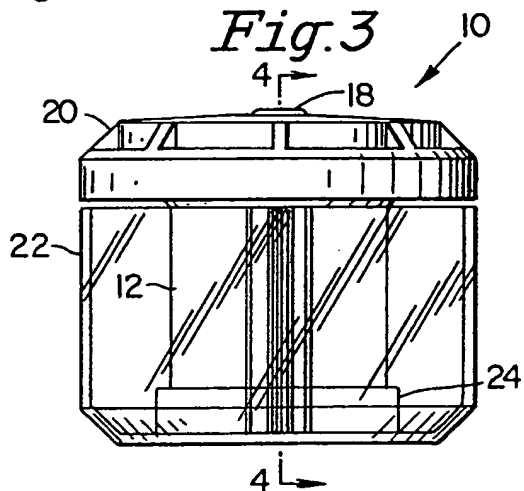


*Fig. 2*

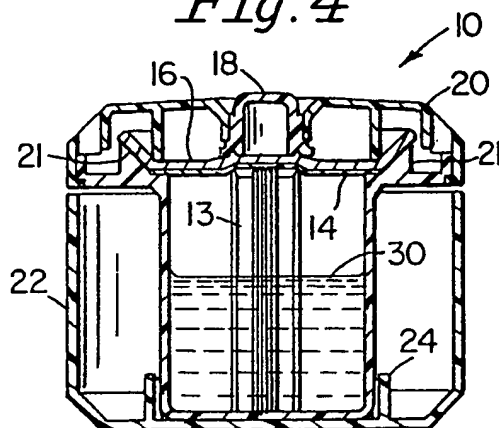


*Fig. 1*

*Fig. 3*



*Fig. 4*



# INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 97/18302

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A61L9/12

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 352 231 A (ARIEH COURVOISIER SA) 24 January 1990 see column 1, line 45 - line 58 see column 2, line 33 - line 38 see column 3, line 65 - column 4, line 7 ---	1-3,7-9, 12-14
A	WO 89 08462 A (GIVAUDAN & CIE SA) 21 September 1989 see claims; figures ---	1,10
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A	EP 0 462 605 A (KURARAY CO ;CHUGAI BOYEKI CO LTD (JP)) 27 December 1991 see page 6, line 14 - line 17 see example 1 -----	3,4,6

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

5 February 1998

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Publication No

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